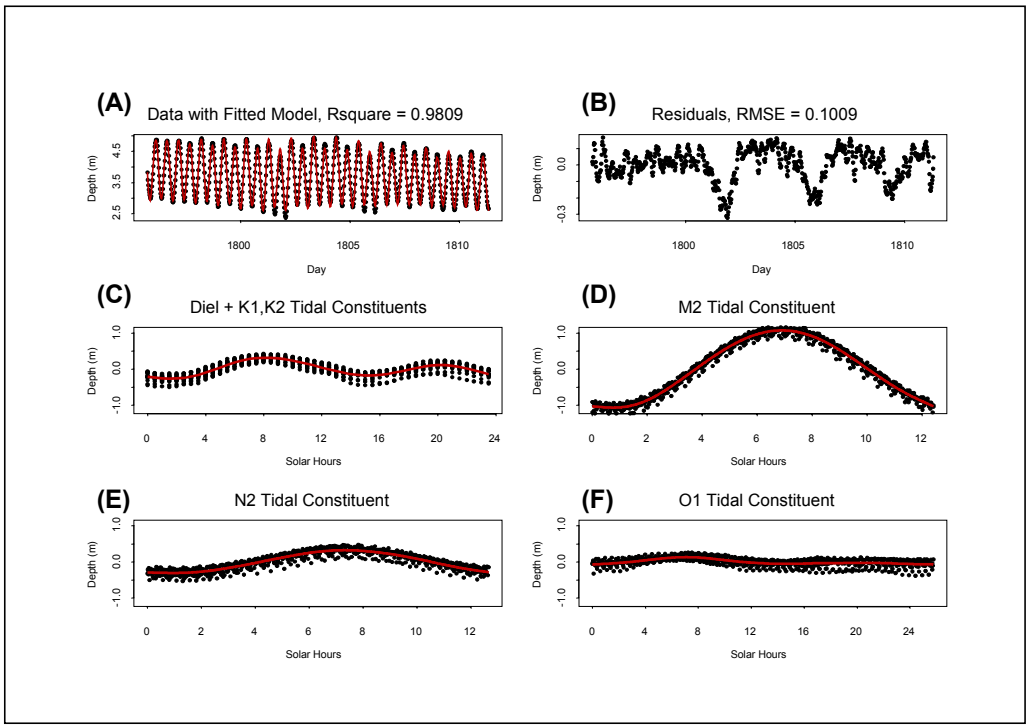

Figure 38. Component plots of deployment-level analyses for water depth at the Lower Duplin site (Sapelo Island NERR) for the period 11/30/1999 to 12/16/1999.

Figure 38 provides a graphical summary of how the model works. Panel (A) depicts the goodness of fit between the observed data and the predicted curve. Panel (B) plots the residuals from the fit of the observed data to the predicted curve, as well as the Root Mean Square for Error (RMSE). Panel (B) is useful for identifying episodic events and irregularities in the data distribution. In this particular example, two to three low-depth events, each approximately 24 hours in duration, were apparent in the plot of the residuals, but were not apparent in panel (A), due to some extent because of differential scaling of the y-axis between these two panels. The x-axis for panels A&B is expressed as days since 1/1/1995, the first date with data in this study. Panel (C) compares the residuals in panel (B) with the predicted 24-hour (diel) signature intended to gauge the influence of solar energy on subsequent water quality parameters. Among deployments lasting 7-30 days in duration, diel signatures were confounded with some of the lesser tidal constituents (K_1, P_1, K_2 and S_2). As a result, the "double bump" curve in panel (C) represents the sum of the diel signature and these (usually) small tidal signatures. This shape is atypical and, in this case, probably represents effects of K_2 and/or S_2 on depth at this site. Panel (D) depicts the main tidal constituent (M_2) with a periodicity of 12.42 hours versus the residuals from panel (B). It is especially important to note the occurrence of daily high and low tides in this cycle when interpreting M_2 patterns, which are also seen in other variables (i.e., minimum DO during the main tidal cycle). Panels (E) and (F) depict the influence of two other tidal constituents, N_2 and O_1, with periods 12.66 h and 25.82 h, respectively. Although observed in this example, these constituents were rarely substantial. More examples and suggestions for interpretation of deployment-level plots are provided in the Results section.